

ABSTRACT

An integrated propulsion and guidance system for a vehicle includes an engine coupled to an impeller via a driveshaft to produce propulsive force. The impeller includes a hub and a plurality of blades, wherein one or more of the blades is pivotably mounted to the hub. A control system provides a control signal to the impeller to adjust the blade pitch of the pivotable impeller blades as the blades rotate about the hub. The change in blade pitch produces a torque on the driveshaft that can be used to control the heading of the vehicle. By varying the magnitude and phase of the control signal provided to the impeller, the torque can be applied in a multitude of distinct reference planes, thereby allowing the orientation of the vehicle to be adjusted through action of the impeller.